EDITORIAL

Hear Ye! Hear Ye!

The manufacturing fraternity of the confectionery industry will assemble in Chicago, May 19-23, 1924. Candy makers, candy foremen, candy superintendents, plant chemists, candy cost accountants, factory managers, candy salesmen, sales managers, purchasing agents and buyers, general managers and all executives of confectionery plants—every candy man interested directly in the production or distribution of confectionery from the viewpoint of the manufacturer will find a community of interest about the N. C. A. Convention and Exposition this year.

Heretofore the production men and department heads "held the fort" while the boss attended the convention, but not so this year; every thinking candy man from the cook to the accountant in a candy plant will find something on the program which directly affects his department. And everybody will enjoy the exposition; in fact, the whole atmosphere of convention week promises to be different this year (we've also ordered a week of Chicago's best weather for the occasion), an atmosphere of getting together and getting down to business on practical matters which should be discussed and thus getting something out of the convention which a man can take back home and apply to his own business with profit. When business men come together with such a determination and viewpoint something worth while is quite liable to happen. So don't miss it.

Make yourselves at home at THE MANUFACTURING CONFECTIONER's Booths Nos. 46 and 47, Municipal Pier. We are at your service.

Talk It Over with Mr. Wells

Mr. Ralph G. Wells of Boston, our staff writer on Factory Management, will be at the N. C. A. Convention this month and we hope many of our readers, especially those outside of New England, will have an opportunity of meeting him. Wells' articles which have appeared in the past eighteen issues of this magazine are based first on his years of practical and successful experience as a factory executive and consultant, and second, on his personal contact with candy men and investigation of confectionery plant operations and management among the confectioners of New England and New York. Mr. Wells would like to meet the factory executives from other manufacturing zones.

What Are Ideal Factory Conditions?

Many candy manufacturers do not know that clean, cool, dry air can be maintained in their manufacturing departments every day in the year at an even temperature and even moisture content; the latter is especially important. Temperature control without moisture control is of little avail. The subject of temperatures is quite familiar to all practical candy men but the subject of "relative humidity" and its relation to our manufacturing processes is comparatively a new topic and yet it is just as important and just as essential to understand as the physical properties of sugar or any other characteristics of our raw materials.

Every candy maker understands boiling points but how many understand the meaning and significance of "dew points," the proper moisture content of the air for each department and how to control it. A series of articles on these subjects will start very shortly.

As soon as the candy manufacturers of the country equip their plants to control the atmospheric conditions of their manufacturing departments then and not until then can the industry ever hope to stabilize their production. When the candy plants of the country are equipped to control the atmospheric conditions in their manufacturing departments then the hard candy and chocolate departments can operate all summer through the hot, rainy weather just as well as in the dead of winter. That means that candy makers will have a steady job all of the year around instead of being laid off on days when it is hot and damp.

When proper relative humidities are understood and observed then the storage problem of made up goods will be practically solved. Confectionery can be stored successfully where the air is conditioned to maintain the right moisture content as well as temperatures. Many storage companies do not realize that different food products require different relative humidities and that confectionery should never be stored on the same floor with meats, cheese and other food products requiring higher percentage of relative humidity.

With the manufacturing and storage problem solved successfully then there is some encouragement for the sales executives to handle the distribution because the goods which are made in plants equipped with conditioned air can be packed right and the shelf life of the goods can be reasonably controlled.

The Blue Book is on the Press! First copies at N. C. A. Exposition

With the Exhibitors

The exhibitor's firm name, space or booth number at the National Confectioners' Association Exposition and a brief news item about each respective exh bit based on information received in answer to questionnaires. Where only firm name and space number appears, the questionnaire was not returned.—*Editor.*

EXHIBITORS TO THE MANUFACTURING TRADE:

Acme Steel Goods Co.
Exhibiting: Acme nailless system of strapping wood and fibre candy boxes, pails, and practically all forms of shipping packages, also Acme barbed box straps, pail clasps, seals and arrows, etc.

J. W. Allen & Co.
Exhibiting: Flavoring extracts and certified food colors.

American Can Company.
Exhibiting: Plain and fancy tin candy containers and paper canisters.

American Candy Pulling Machine Co.
Exhibiting: Candy pulling machinery.

Anheuser-Busch, Inc.
Exhibiting: Confectioners' Corn Syrup.

The Aridor Company.
Exhibiting: Aridor display jars and moisture extracting devices.

Atlantic Gelatine Co.
Exhibiting: Edible gelatine for marshmallow work.

Banana Specialty Co., Inc.
Exhibiting: Tropical fruit paste for nougats, caramels, etc.

The Bastian-Blessing Co.
Exhibiting: Soda fountains.

Bendix Paper Co.
Exhibiting: Specially designed lithographed labels, seals, watoline, bendipads, bendifane, etc.

The Best Foods, Inc.
Exhibiting: Kandex, Nucoa, Nucoline, Plastic Nucoline.

Betts Products Co., Inc.
Exhibiting: Betco Ideal Caramel Cream, semi-prepared raw materials used in the manufacture of candy.

Blanke-Baer Extract & Preserving Co.
Exhibiting: Flavoring extracts, certified food colors, dipping fruits.

Blumenthal Bros.
Exhibiting: Chocolate and cocoa, chocolate liquors.

Emil J. Brach Confectionery Machinery Co.
Exhibiting: Confectioners' Machinery.

The Brunhoff Mfg. Co.
Exhibiting: General line of glass novelties.
In attendance: Mr. E. Brunhoff, President.

B. H. Bunn Co.
Exhibiting: The Bunn Package Tying Machine.

The Century Machine Co.
Exhibiting: Fondant mixers.

J. G. Cherry Co.

Cincinnati Aluminum Mould Co.
Exhibiting: Aluminum candy moulds.

Clinton Corn Syrup Refining Co.
Exhibiting: Corn Products.

Conley Foil Co.
Exhibiting: Plain and fancy tin foils.

Continental Paper & Bag Mills Corp.
Exhibiting: Glassine bags, embossed and white laid confectioners' bags, advertising bags, wrapping paper, etc.

Crescent Manufacturing Co. No. 140.
Exhibiting: Mapleine, with demonstrations of its use.
In attendance: Bruce Hartman.

Dennison Mfg. Co.
Exhibiting: Decorative papers and specialties of all kinds.

Thomas W. Dunn Co.
Exhibiting: Edible gelatine specially produced and blended for the confectionery and ice cream industry.

Du Pont Cellophane Co., Inc.
Exhibiting: Candy boxes, drugs, crackers, etc., wrapped in Cellophane; an Aquarium and American Coat-of-Arms, both of which are made entirely of Cellophane.

Farley & Loetscher Mfg. Co.

Ferguson & Haas, Inc.
Exhibiting: Bar, taffy and sucker wrapping machines.

Foote & Jenks.
Exhibiting: Soluble flavor concentrates exclusively, natural and compound flavors for makers of confectionery; specimens of various citrus oils and forms of citrus flavors.
In attendance: C. R. Foster, A. A. Koch, C. H. Redding, N. Stormont.

Franklin Sugar Refining Co.
Exhibiting: Franklin Sugar Products.

Gallanis Bros.
Exhibiting: Candy specialties.

The Gin-Wol Co.
Exhibiting: Fancy candy box wraps and wrappers featuring The Gin-Wol process.

J. W. Greer Co. 192-3.
Exhibiting: The Greer line of confectionery machinery.
In attendance: Mr. and Mrs. J. W. Greer, Alfred Martini.

Ira L. Henry Co.
Exhibiting: Plain and fancy candy boxes.

Hohberger Mfg. Co.
Exhibiting: Confectioners' machinery and equipment.

Horine & Bowey Co.
Exhibiting: Flavoring extracts and concentrates, food colors, and special display of interest to wholesale confectioners.
In attendance: C. F. Bowey, C. D. Craig, Thomas Spare, J. W. Hanner.

Inland Mfg. Co.
Exhibiting: Display pail covers.

The W. K. Jahn Co.
Exhibiting:

Kalamazoo Paper Box Co.
Exhibiting: Plain and fancy candy boxes.

J. M. Kaupp & Son.
Exhibiting: Lithographed box tops and wraps, labels, fancy box paper.

Kay-White Products, Inc.
Exhibiting: Semi-prepared raw materials for making candy; nougat creme, caramel paste, fountain toppings, etc.

Keystone Fruit Products Co.
Exhibiting: Dipping and glace fruits.

Knickerbocker Case Co.
Exhibiting: Sample cases, bags, portfolios, etc.

H. Kohnstamm & Co., Inc.
Exhibiting: Flavoring extracts and certified food colors.

Lehmaier, Schwartz & Co., Inc.
Exhibiting: Plain and fancy tinfoils.

The Manufacturing Confectioner Publishing Co., Nos. 46-47
Exhibiting: The Allured Manufacturers' Publications:
The Manufacturing Confectioner's Blue Book.
The Manufacturing Confectioner—complete file of back issues.
The Confectionery Foreman—a semi-annual supplement.
The Manufacturing Confectioner's Library of Technical and Practical Literature.
In attendance: Earl R. Allured, M. B. Kovnat, Prudence M. Walker, George J. Shaler. Mr. Ralph G. Wells of Boston, who has conducted the series of articles on Plant Management, Factory Practices, etc., in our publication, will be in attendance Thursday and Friday, May 22nd and 23rd. Our readers will have this opportunity of meeting Mr. Wells and discussing with him any individual problems.

Mid-West Box Co.
Exhibiting: Corrugated fibre-board boxes and products, with air cell and cushion features.

Thomas Mills & Brother, Inc.
Exhibiting: Confectioners' Equipment.

Milwaukee Paper Box Co.
Exhibiting: Plain, fancy and folding candy boxes.

Morris Paper Mills.
Exhibiting: Cardboard caddies.

National Aniline & Chemical Co.
Exhibiting: Certified food colors and malic acid.

National Art Co.
Exhibiting: Box tops, labels, etc.

National Bundle Tyer Co.
Exhibiting: Parcel tying machines.

National Equipment Co.
Manufacturers of candy and chocolate machinery.
In attendance: Frank H. Page, Geo. A. and A. Linton Bausman, Wm. G. Tucker, Howard C. Baum, C. B. Turner, B. E. C. Gillette, Edwin F. Moody, Ralph Duchacek, Frank S. Moulton.

New England Paper Box Co.
Exhibiting: Fancy candy boxes.

The Nulomoline Co.
Exhibiting: Nulomoline.

E. & A. Opler, Inc.
Exhibiting: Display featuring the distribution and warehousing of cocoa for the convenience of cocoa buyers throughout the United States.
In attendance: Arnold Opler.

H. H. Ottens Mfg. Co., Inc.
Exhibiting: Flavoring extracts and certified food colors, confectioners' specialties.

Package Machinery Co.
Exhibiting: Automatic kiss, chocolate bar and stick candy wrapping machine.

Penick & Ford, Inc.
Exhibiting: Cane and corn products.

Racine Confectioners' Machinery Co.
Exhibiting: Confectioners' machinery and equipment.

Ravenswood Novelty Co.

Read Machinery Co., Inc.
Exhibiting: Mixing machinery of all kinds.

Chas. A. Rindell, Inc.
Exhibiting: Labels.

W. C. Ritchie & Co.
Exhibiting: Plain and fancy candy boxes.

Savage Brothers Co.
Exhibiting: Confectioners' machinery and equipment.

F. J. Schleicher Paper Box Co.
Exhibiting: Masterbuilt candy boxes on a plastic bronze effect background on an ancient artisan carving an object out of stone, illuminated by varicolored electric lights.
In attendance: Messrs. Louis, Allen and Frank Schleicher, B. F. Fischer, Geo. G. Turner, Fred B. Webb.

H. Schultz & Co.
Exhibiting: Plain and fancy candy boxes.

Seneff-Herr Co.
Exhibiting: Semi-prepared raw materials for candy making; nougat creme, caramel paste, etc.

Harold A. Sinclair.
Exhibiting: Delft gelatine.

Smith Scale Co.
Exhibiting: "Exact Weight" scales.

Stadler Photographing Co.
Exhibiting: Photographs in color of candy and candy packages, and colored counter and display cards.

A. E. Staley Mfg. Co.
Exhibiting: Corn products.

(Continued on page 21.)

The Drake Hotel, Chicago—N. C. A. Convention Headquarters, May 21-23.

Come to Chicago May 19-23

PRACTICAL problems of the industry, discussions of matters that will tend to make the candy business better, a Forum for the exchange of ideas that will be of benefit to manufacturers from all parts of the country will be among the outstanding features of the convention of the National Confectioners' Association, which will be held at the Drake Hotel, Chicago, May 19 to 23, simultaneous with the candy exposition and its visualization of America's billion dollar industry on the Municipal Pier.

Harry Wheeler—Wednesday Morning

While the convention proper will not convene until Wednesday, May 21st, committee meetings and conferences of vital importance to the industry will be held Tuesday. The convention will be formally opened by an address by the president of the association, Walter H. Belcher of Boston. The proceedings of the conclave of close to 1,200 manufacturers expected in Chicago for the sessions, will be divided into two parts. The official reports and general discussions will be held in the mornings at the Drake Hotel, while the practical problems will be discussed by experts and in the form of Forum talks in the afternoons on the Municipal Pier, which is only a short walk from the hotel. Following the opening address by President Belcher and reports of the various committees, the principal speaker of the morning session Wednesday will be Harry Wheeler, former president of the United States Chamber of Commerce, who is expected to give a message that will be of peculiar interest to the candy manufacturers of the country.

Open Forum on Practical Subjects

On the afternoon of Wednesday on the Municipal Pier practical cost accounting will be the theme that will predominate the program. The principal speaker on this topic will be E. K. Rice of the Johnson Biscuit Company of Sioux City, Iowa, a leader in the movement of uniform cost accounting and a man who has had years of experience in the installation of the cost accounting system advocated by the association, and who knows of his own practical knowledge what this system has accomplished for more efficient business. It is expected that this talk will be one of the most illuminating of the convention. His address will be followed by an open Forum discussion of the subject and talks by others qualified to speak along these lines. The members of the association will be invited to ask any questions that might spring up out of their own experience. These questions will be turned over to Mr. Rice to answer.

Another subject of interest to the trade that will be discussed the same afternoon will be "The Use of Chocolate in the Candy Factory". Presentation of this phase of the industry will be made by prominent manufacturers who are best qualified to accentuate this feature of the business as it should be done. The same sort of informal discussion will follow these talks

and there also will be a "question box" on the chocolate question.

V. L. Price—Thursday Morning, the 22nd

Vincent L. Price of St. Louis, director of publicity of the National Confectioners' Association, will be the chief speaker at the morning session Thursday. He has selected a topic that cannot help but prove of the greatest interest to every one connected with the industry. It is "How to Make the Candy Business Better". Mr. Price has always had this idea in mind in all his work to improve this big business of the nation, and this address undoubtedly will be of benefit to everyone who has the interest of the candy business at heart. Informal discussion will also follow this address. In the afternoon on Thursday several topics covering most interesting phases of the candy business will be on the program. Walter C. Carlson of the Milwaukee Paper Box Company will speak on "The Relation of Paper Boxes to Candy". The usual Forum and paper box questions will follow the address.

Candy credits, a big question at this time, will be another important subject on the Thursday afternoon program. Men eminently qualified to discuss this angle of the business will present the problem in a constructive way. This is a matter of vital importance—the extension of credits under present conditions of business and many valuable points probably will be brought out in the principal talks and the discussions and questions and answer box that will follow this part of the program.

Golfers Round-up on Monday, the 19th

Delegates to the convention are expected to begin to arrive the Sunday preceding. It is sure that the golfers will be on the scene by Monday, when the all-day golf tournament of the association will be held at one of the prominent golf courses. There are many crack players among the membership of the association who will vie for the three prizes that will be put up for the contest.

Package Goods Manufacturers—Tuesday Evening, the 20th

On Tuesday the preliminary business of the convention will start with meetings of the executive, nominating and resolutions committees. Tuesday evening there will be an important conference of the package goods manufacturers. The chairman of the conference will be Wilfrid I. Booth of Elmira, New York, who also is chairman of the package goods division of the association. This parley will be of interest, as the package goods manufacturers, who produce the fancy and high grade confections put up in artistic style, have many problems of their own which will be threshed out at this meeting.

One of the most interesting conferences of the conclave will be held on Tuesday night, when the secretaries of the various trade associations will get together in a conference for the first time to consider problems, the solution of which is bound to be of great benefit to the industry.

The Entertainment

Preparations are being made by George H. Williamson, Chairman of the Entertainment Committee, and his corps of assistants to provide ample entertainment for the delegates and their wives and relatives. Wednesday evening there will be a theater party for the ladies. In the morning the ladies will be taken for an automobile tour of the boulevards and parks of the city, reaching the South Shore Country Club, one of the picture spots of the city, in time for luncheon in their honor. The piece-de-resistance of the entertainment program will be the banquet Thursday evening at the Drake. An elaborate musical program will be provided and dancing will follow the dinner.

That the exposition on the Municipal Pier will be a tremendous success is evidenced by the interest the exhibitors are taking in making this first exposition controlled and managed by the association an epoch in the history of the industry. Exhibitors are not only putting forth every effort to make their displays attractive and educational, but they are sending out thousands of complimentary tickets to insure an attendance that is expected to eclipse that of any exposition ever held.

With the Exhibitors

(Continued from page 19.)

Wm. J. Stange Co. No. 140.
Exhibiting: Flavoring materials and certified food colors, also specialties.
In attendance: R. J. Rooney.

John Strange Pail Co.
Exhibiting: Fibre board pails.

Union Confectionery Co., Inc.
Exhibiting: Machinery.

United Chemical & Organic Products Co.
Exhibiting: Edible gelatine.

United States Foil Co.
Exhibiting: Plain and fancy foils of every description.

The United States Printing & Lithograph Co.
Exhibiting: Samples of counter display containers, cartons, candy box wrappers and advertising matter.

Vacuum Candy Machinery Co.
Exhibiting: Simplex vacuum cookers, Simplex plastic press equipment, Simplex cutting machine, Simplex curl machine.

Voorhees Rubber Mfg. Co.
Exhibiting: Rubber Candy Molds.

John Werner & Sons.
Exhibiting: Confectioners' machinery and equipment.

White-Stokes Co.
Exhibiting: Semi-prepared raw materials for making candy, soda fountain toppings, etc.

H. O. Wilbur & Son.
Exhibiting: Chocolate and cocoa, chocolate liquors.

THE
PURCHASING DEPARTMENT

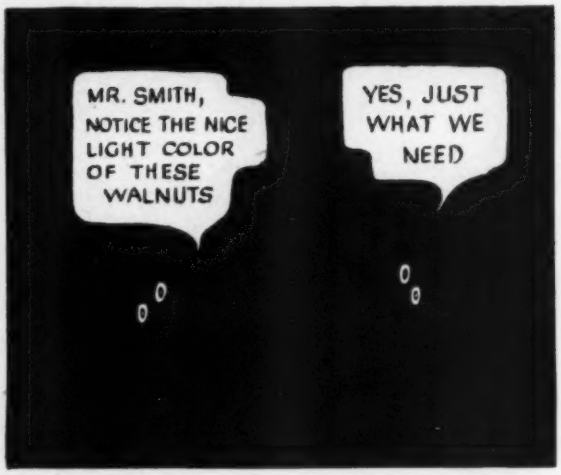
II—Desk Tests for Shelled Nuts

The second of a short series of articles on "Fifty Desk Tests for Raw Materials."

by A. Adams Lund

(*Continued from April issue*)

THE first sale of candies is made through their appeal to the eye. Many devices have been employed by confectioners to increase the attractiveness of individual pieces. One of the chief of these is the practice of topping with nutmeats. Here, more especially than in other candy-making operations, such details as the color of the skins of the nut kernels may make or mar the package by making it look attractive and appetizing on the one hand; and on the other, dull, lifeless, or even stale.



LET THERE BE LIGHT!

Color of Skins a Clue to Condition

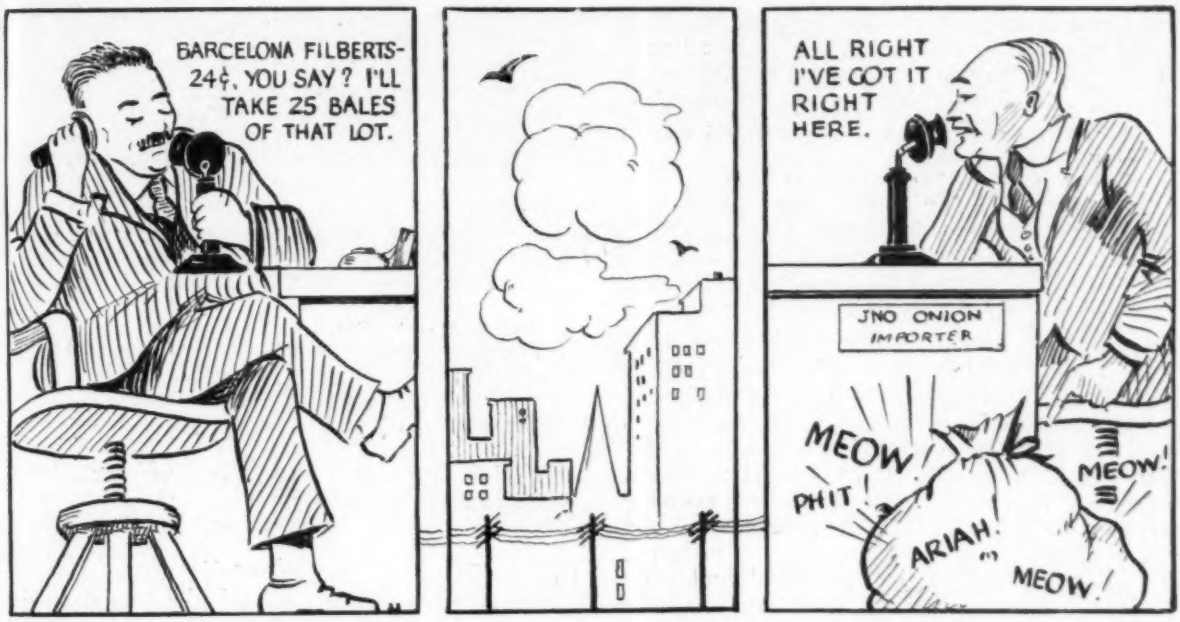
Two of the nuts most extensively used for this purpose are the walnut and pecan. We require that these be bright in appearance and light in color. Although frequently regarded as synonymous by the trade, one is not a condition precedent to the other; dark-skinned lots are sometimes lustrous, while a lot which is light in color may possess the dull or waxy appearance characteristic of certain coarse varieties like the Turkish walnut.

When we say that a nut must be light in color, just how light do we mean? Lightness of color is a relative term. It depends largely upon what we consider to be a normal degree of lightness. Unfavorable climatic conditions such as the excessive rains which preceded the French walnut harvests of 1923, may cause an entire crop to be several shades darker than the crop preceding. The natural ageing or drying of the skins is greatly hastened by exposure to light or heat and since this process is invariably accompanied by a darkening of the color, darkness of color may be regarded as prima facia evidence of poor quality (for the most part, old crop, poorly cured or poorly preserved nuts).

The method which relies on the eye to tell if the color of a lot is suitable, is in a class with the time-honored practice of throwing into the batch, a "lump" of color paste or a "dash" of flavor. We must adopt some arbitrary grading standard (obviously of our own making) by which all samples may be judged alike, and according to a preconceived idea of our individual need or how particular we are.

Choosing a Standard

If you buy on comparison of an assortment of samples, the problem of selecting goods of suitable color is considerably simplified—provided, of course, that the assortment contains at least one really light sample with which to compare. If it does not, you may suddenly discover that you have bought a much darker lot than you imagined, either because the light was poor, or your eyes had deceived you as to the sample's true shade. Irrespective of whether the purpose of your test is to compare the lightness of color of one or more samples or to enable you to pass upon the quality of a subsequent delivery, an appropriate standard of comparison is indispensable. The practical impossibility of preserving undarkened, a type sample of the color of skin desired (the sample being apt to deteriorate faster than the lot from which it was drawn), makes necessary the employment of an arbitrary standard such as a background of colored paper with which to match all lots submitted or purchased.



In practice, this background may take the form of a piece of ordinary kraft paper of the color and degree of lightness required. (Every factory and office can produce dozens of different shades of kraft paper, odds and ends which have been shipped in as bags, wrapping paper, etc.) Many of these shades correspond to the color of walnuts, pecans and almonds.)

9. To Determine the Relative Lightness of Nutmeats

Select a background of the approximate color desired. If you prefer to standardize on the color of any particular lot or type sample, match as closely as possible, the shade which predominates among the kernels. Having chosen the standard, keep it protected from light when not in use, to prevent fading.

Count out 100 whole kernels from the sample to be tested. Spread on testing paper, convex surface up. Carefully grade out all kernels darker than the standard. (This operation is facilitated by an optical illusion; kernels which approximate the color of the standard will blend with it, thus tending to establish a greater difference in color among the remaining kernels.) As the season progresses, an increasing allowance must be made for age darkening.

Another method which may be used to test lots individually, is as follows:

10. To Determine the Approximate Proportion of Light and Light Amber Meats

Select for this purpose three grading papers instead of one; the first to be the color of the lightest kernels you expect to receive, the second to be an average color or shade desired, the third to be the darkest shade which you would permit to predominate in any delivery. Match 100 kernels, one by one, to these three papers and form two separate piles of them, as follows:

Kernels darker than "A" and equal to or lighter than "B" constitute "Lights."

Kernels darker than "B" and equal to or lighter than "C" constitute the darker grading known as "Light Ambers."

The number of nuts in each pile corresponds to the percentage of light and light amber kernels respectively, which were present in the sample.

N. B. The terms "Light" and "Light Amber" are arbitrary, in this instance. A, B and C refer to the three grading standards in the order mentioned.

To determine the lightest-colored of several lots, use the single color standard suggested in Test No. 9. The samples may be spread on the paper side by side and advantage taken of the "blending" illusion.

Color Grading Individual Lots

It has been possible to arrive at the relative lightness of samples by matching with a predetermined standard those shades which predominate in each sample. What if the sample is a conglomeration of shades with no one color visibly predominating? The California Walnut Growers' Association put out a grading chart in 1914. The same grading is in use today. It shows approximately twenty distinct graduations in color in the California walnut. The first four grades are the "light," corresponding to a fairly light quality of Bordeaux. The next eight or nine are "light ambers," and the remainder, "standard ambers." In the latter grading are included culls which are entirely black. Recent small importations of Italian walnuts have been similarly color-graded, the lightest being the "extra light" (almost white in color—one of the importers was convinced that they must be bleached, but examination showed the color to be genuine).

Notwithstanding the greater uniformity of color in the French varieties which makes possible the single and presumably light grading, there are often substantial proportions in this grading of what the Californians would call "light amber" or, allowing for carelessness in the selection, dark-skinned meats or the unat-

tractive-looking yellow-skinned "Arleqins." As to the mixing in of old crop kernels, the attitude of the trade may be typified by the following conversation which took place a few weeks ago:

First Importer: "Are you still offering old crop walnuts?"

Second Importer: "Yes, I still have a few."

First Importer: "On a crazy market like th's? Can't you make them NEW crop?"

The second importer, in relating the incident, remarked, "Of course, he meant that I ought to mix them. I have to do it in order to get rid of them but I'll wait awhile and see if somebody won't buy them."

Realizing that the percentage of darkened kernels and the degree to which they have darkened are fairly safe indications of the quality and organic condition of light-skinned nutmeats, the following test of lightness has been evolved. It may take a little time to prepare the chart but if your walnut purchases, for instance, should run into volume, you would find your labors well-recompensed by being able to check accurately the quality of the lots delivered to you and the progress of their deterioration while on your hands.

11. To Record the Average Lightness of Skin of Pecans and Walnuts

Secure a number of very light-skinned kernels. Carefully match the color of these kernels with a basic oil or water color (the shade to match the skins when dry). Now select a number of the darkest kernels which you would consider acceptable in any reasonably good delivery. Match this shade with a corresponding oil or water color. Be sure that these two basic colors represent the two extremes of acceptable color and that the coloring substances used are primary colors and not mixtures.

Prepare a suitable cardboard chart and apply evenly, one under the other, 1-inch strips of color as follows:

Shade A—Light color, unmixed.
Shade B—8 parts light to 1 part dark, (to be proportioned carefully and well-mixed).
Shade C—7 parts light to 2 parts dark.
Shade D—6 parts light to 3 parts dark.
Shade E—5 parts light to 4 parts dark.
Shade F—4 parts light to 5 parts dark.
Shade G—3 parts light to 6 parts dark.
Shade H—2 parts light to 7 parts dark.
Shade I—1 part light to 8 parts dark.
Shade J—Dark color, unmixed.

When dry, verify the first and last shades with the kernels from which they were copied and examine the intermediates carefully for sequence of shade.

Count out 100 kernels from the sample to be tested and compare singly with the chart. Tally each kernel opposite the appropriate shade as indicated on the form below. Multiply the completed tally of each shade by the fixed grading allowance allotted to that shade. Kernels darker than J are graded zero and have no effect on the index number except to reduce it proportionately. Add the extensions and divide by 10. The resulting percentage is the index of lightness for the sample tested. For example:

Shade	Fixed Grading Allowance		Tally	Extension
A	10	×	4	40
B	9	×	10	90
C	8	×	19	152
D	7	×	35	245
E	6	×	13	78
F	5	×	7	35
G	4	×	7	28
H	3	×	3	9
I	2	×	0	0
J	1	×	0	0
Darker shades, culls, and Arlequins	0	×	2	0
				10(677
				67.7%

The percentage of dark meats and Arlequins derived from the preceding tests should be definitely limited by specification.

The Color of the Meats

The color of the meats (in cross section) is another valuable aid in determining the quality and physical condition of nutmeats. In pistachio-nuts greenness of color is regarded as the chief indication of fine quality, at least to the confectioner, who looks upon it as a sort of expensive decoration.

12. To Determine Percentage of Dark or Black Meats

Count out and cut in half 100 kernels of the sample to be tested. Brazils should be cut lengthwise, since the tendency is for the meats to discolor near the ends. Pistachios, when cut across will ordinarily quarter themselves in a lengthwise direction and show up the color of all parts of the kernel.

The cut surface of almonds, Brazils, walnuts, pecans, and similar white-meated nuts should be nearly white or with a faint cream tint (the whiter, the better). A translucent or oily appearance is indicative of age or poor quality. It is almost axiomatic that the higher the oil content, the coarser the flavor (e. g., Bordeaux vs. Chaberte and Mayette walnuts).

Grade out dark and black meats; make a separate record of those which have become oily and translucent. The number of kernels in each group corresponds to the percentage present in the sample.

Curing

Curing is the process of drying out the nuts either before or after shelling. In peanut-curing, the drying is accomplished by stacking the stems bearing the pods around wood poles, where they are left to dry under natural conditions. In Brazil-nuts, walnuts, pecans, etc., artificial drying accomplishes the same purpose.

Meats which have not been thoroughly cured have a tendency to mould, turn rancid and become black. Their higher moisture content makes their use uneconomical, and explains the strong buying preference for old crop Brazil-nuts for a month or so after the new goods become available. Following are a few simple and practical means of telling whether nutmeats have been thoroughly cured:

13. To Determine Thoroughness of Cure

BRAZILS: Let a handful of the kernels fall in quick succession upon the desk or other hard surface and note the resulting sound. A sharp crackle indicates that the meats have been thoroughly dried. If the sound is dull, the nuts may be taken to be under-cured and should be spread at once to prevent moulding. Nuts in this condition will be found to be pliable and rubbery when worked between the fingers.

PECANS: Break a number of the kernels with the fingers. If they are crisp and break with a snap, they may be regarded as properly dried.

A handful of under-cured kernels squeezed tightly in the hand will feel damp and springy. In this condition they must be spread immediately to prevent moulding. The breaking test may be adapted to walnuts, etc.

Soundness

It is needless to stress the necessity that nuts be free from mould, animal matter and organic decay. Upon this qualification rests the healthfulness, preservation, and ultimately, the sale of your candy.

Extremely exacting as is the Department of Agriculture in the examination of imported nutmeats, one might go considerably astray were he to take into his product at random, an average quality of nuts "passed" by the Department. From this standpoint, government inspection appears to have failed miserably. Ask any importer.

There are possibly three main reasons why this condition exists. The inspector may overlook the offending packages. The importer may employ the services of a "recleaning" house whose rumored connections appear to make possible the fulfillment of their promise "Goods guaranteed to pass or no pay." Lastly, the importer himself may be tempted by the ease with which he may "switch" lots to get in worthless material.

Let us suppose that John Onion gets in a lot of filberts which contain 60 per cent of inside and outside mould. The lot is duly inspected on Onion's premises and refused entry. (The importer is under penal bond and responsible to the government for the custody of the material.) To remove the *external* mould by mechanical brushing and subsequent handpicking is entirely practicable, but *inside* mould—that is another matter. Even if it were possible to isolate and remove these weakened kernels, the resulting "shrinkage" of the lot would be ruinous to the importer's profit.

Consequently, the bags containing the defective nuts are divested of their contents and filled with another lot which has already been passed by the Department. The mouldy material is then packed in the bags made available by the good lot and held in readiness for the first unsuspecting or indifferent purchaser; while the sound nuts are again confidently submitted to the Department, only this time in the "unpassed" packages. (Occasionally an unkind fate turns the tables on the importer and the supposedly sound lot fails on the re-examination!)

Even barring these things, do you consider goods containing ten per cent of inedible nuts to be suitable for use in candy?

"I roast mine," says Smith.

Yes, but would you care to eat a plate of nicely roasted beetle-grubs and mould spores for your luncheon, Mr. Smith?

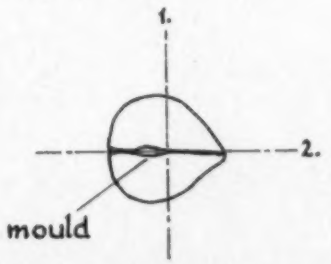
Examining the Mould

Except on filberts, most of the trouble which we experience with this growth originates on the external surfaces of the kernels. In such cases it is a simple enough matter to determine extent of the mould from the appearance of the outside of the sample. The chief precaution to be practiced should be to see that the sample is drawn from various sections of the package since it is the nature of mould to occur in pockets or clumps.

14. To Determine the Percentage of External Mould

Count out 100 whole kernels from the sample to be tested. Carefully examine each kernel and separate out those whose surfaces show evidences of mould. The number of kernels thus graded out represents the percentage of mouldy kernels in the sample. Note whether there are evidences of mould in the crevices of any shriveled kernels which may be present in the sample. (These depressions almost invariably escape the brush when the lot is mechanically cleaned.)

"Beauty may be only skin deep" applies with particular emphasis to the filbert. Kernels which from the outside appear to be perfectly sound, may be completely moulded inside. Take a kernel in this condition and it crushes readily when you squeeze it firmly between the fingers. If you haven't a pen-knife handy, you can determine roughly the soundness of the sample by squeezing a number of the kernels in this fashion. The nuts which crush easily are either old and in consequence, partially hollow inside, or softened by mould. Obviously, however, this is not an accurate test.



QUARTERING MOULD

15. To Determine the Percentage of Internal Mould in Filberts

Count out 100 whole kernels from the sample to be tested and either halve or quarter each kernel. If halved, care should be taken to cut them along the lines of natural cleavage (Line 2 in the accompanying diagram). Line 1 shows how it is possible to

(Continued on page 35.)

CHEMISTRY AND CONFECTIONERY MANUFACTURE

Improved Methods for Manufacture of Fondant Goods

by H. S. Paine and J. Hamilton

Carbohydrate Laboratory, U. S. Bureau of Chemistry

The confectionery industry is fortunate in having enlisted the cooperation of the Bureau of Chemistry at Washington in doing some practical research work on vitally important phases of our manufacturing processes and problems of production. Exhaustive experiments have been carried out the past year by the Carbohydrate Laboratory by Mr. H. S. Paine, who is an expert sugar chemist, and Mr. J. Hamilton, an experienced candy maker. This makes an ideal combination for research work—a coordination of the technical and practical resources applying to our manufacturing problems.

This first chapter of the article is on the subject of

I—Sugar Crystals vs. Sirup Films in Fondant

MANUFACTURE of confectionery is an old art which, as is the case with many industries, has been developed with little or no assistance from applied science, including chemistry, but which has, nevertheless, been developed very effectively. While chemistry has been of great constructive assistance in many industries, it has contributed very little in a direct manner to the progress of the confectionery industry. Not only is there a lack of chemical literature pertaining directly to confectionery manufacture, but, so far as the writers have been able to ascertain, there has been practically no explanation from chemical and physical standpoints of the processes used in candy manufacture, the reasons for the various precautions observed and the influence of variation in character of materials. It seems reasonable to assume that an explanation of the underlying or fundamental principles involved should be of considerable constructive value in the improvement of processes and in the more ready diagnosis and correction of difficulties which arise from time to time.

Although he is perhaps not aware of the fact, the candy maker is really dealing with sugar chemistry in a very adept way in so far as the expert manipulation of sirups, crystallization of sugar and the like is concerned. It would seem, therefore, that the professional chemist has a useful function to perform in relation to confectionery manufacture, even though he may not actually be master of the technic of candy making.

It is the hope of the writers to show in these articles that chemistry can be of real assistance to the confectionery industry both by way of explaining fundamental principles and by way of improving processes. These articles are confined to a discussion of fondant types of candy and the purpose is to give a chemical and physical explanation of some of the most typical features of candy manufacturing processes applying to such types of confection and finally to describe a number of improvements in processes for the manufacture of fondant goods which have been originated and developed by the writers. In order that these improvements may be more readily understood, an explanation of the fundamental character of fondant will first be given. We shall attempt to make this chemical and physical explanation in terms that will be intelligible to all.

Fundamental Character of Fondant

Fondant is composed of a great multitude of sugar crystals which are only apparent under the microscope and which are more or less separated by exceedingly thin films of a heavy sirup. Owing to the microscopic size of the sugar crystals, these sirup films are not apparent to the eye and fondant therefore appears to be exclusively a solid. In the manufacture of fondant from a sirup composed of varying proportions of cane or beet sugar (chemically termed "sucrose") and commercial glucose by boiling to certain temperatures, quickly cooling and agitating in a beater or similar device to produce rapid crystallization of sugar ("sucrose"), conditions should be so controlled as to cause formation of minute crystals which are practically impalpable and cannot be detected by the tongue. If such crystals are large enough to be detected by the tongue, the fondant is granular or "grainy". The smoothness of

* This article, written from a more strictly chemical standpoint, appeared in the May, 1924, issue of *Industrial and Engineering Chemistry*.

the fondant is, therefore, determined by the size of the sugar crystals.

Creaming (crystallization) at relatively low temperatures with sufficient agitation favors the formation of small sugar crystals, whereas creaming at higher temperatures tends to produce larger crystals. The manufacture of high quality fondant, aside from influence of grade of raw materials, is essentially a problem of control of water content and size of sugar crystals as determined by such factors as temperature and degree of agitation during creaming (crystallization). The presence of products such as invert sugar and glucose in the sirup which is being creamed tends to prevent excessive growth of the sugar crystals.

The skill of the "cream man" in the control of these factors is rather similar to that of the expert sugar boiler in a sugar factory or refinery, with the important difference that, whereas the sugar boiler starts with a clarified sirup obtained direct from sugar cane or sugar beets and crystallizes the sugar from the sirup in two or three operations with separation of residual sirup by means of a centrifuge, the candy maker employs a sirup prepared from white sugar (and glucose) and causes crystallization of sugar to occur in one operation without removing any residual sirup at all. The residual sirup, therefore, remains in the fondant and constitutes the more or less continuous sirup film which envelopes and separates the microscopic sugar crystals present in the fondant.

The relation of microscopic sugar crystals and sirup film to each other in the fondant is somewhat similar to that of a mixture of sand and water. Moist sand occupies more space and weighs less per cubic foot than dry sand. The explanation of this fact is that a film of water coats each grain and separates it from the adjacent ones. The water, in this case, behaves similarly to the sirup film, and the grains of sand are analogous to the sugar crystals. Since fine sand has a larger number of grains per unit of weight, and consequently more surface area, addition of water to it causes a greater increase in bulk than in the case of coarse sand. Here again, the variation in the size of the sugar crystals is similar in effect to the variation in size of the grains of sand.

If a small quantity of water is poured into a vessel containing dry sand, the friction of the particles keeps the volume from increasing, but the bulk increases if the moistened sand is dumped out and then returned to the vessel with a shovel or trowel. The percentage of water by weight which will give the greatest volume —corresponding to the largest percentage of voids (i. e., vacant spaces between the grains of sand)—varies in fine and coarse sands from 5 to 8 per cent. In a similar manner to the mixture of water and sand, the mixture of microscopic sugar crystals and sirup film which constitutes fondant may vary so as to affect the physical character of the fondant. For instance, in a high boiled fondant the proportion of sugar crystals to sirup film is increased and the fondant is stiff, whereas a lower boiled fondant is softer and more plastic owing to an increase in the proportion of sirup film present. In a "short" fondant, owing to increased proportion of sugar in the batch, the proportion of sugar crystals is increased relatively to sirup film, thus making the fondant less fluid.

The preparation of sirup film in the fondant is determined by the total amount of water present, and this in turn is determined by the temperature to which the sirup from which fondant is prepared is cooked. This sirup film being in constant contact with the sugar crystals is always maintained in a saturated condition. In other words, the sirup film holds all the sugar in solution which is possible at a given temperature and is saturated at that temperature. When the temperature rises an additional amount of sugar crystals is dissolved, and the proportion of sirup film present is increased and the amount of sugar crystals decreased. This explains why fondant becomes softer as the temperature rises, either in a melting kettle or when encased in chocolate.

Another factor is the viscosity of the sirup film, this film being of heavier consistency at lower temperatures and of lighter consistency at higher temperatures. The proportions of sugar and glucose dissolved in this sirup film depend upon the proportions of sugar and glucose used in the original sirup from which the fondant is prepared.

Fondant is plastic and may be pulled or stretched to a certain extent. In this respect it behaves similarly to putty, which consists of whiting and linseed oil. In the case of putty, the particles of whiting correspond to the sugar crystals in fondant, and the linseed oil corresponds to the sirup film. When fondant or putty is pulled the surface assumes a drier appearance, but when compressed it appears more oily or sirupy on the surface. This phenomenon is apparently due to alternate stretching and longitudinal compression of the sirup or oil films in fondant or putty, as the case may be. This partly explains the change in physical appearance of fondant when it is worked between the fingers, although another factor is involved which will be explained later. Without the presence of sirup films fondant could not be stretched at all. A "short" fondant contains an unusually small proportion of sirup films and therefore tends to break short when stretched. The proportion of sirup films in "short" fondant may be increased by a lower cook.

The texture of fondant is largely determined by the proportions of sirup films and sugar crystals and these proportions are controlled by the various factors already discussed.

(Continued in next issue.)

Organizing to Save Time

A Discussion of the Management Problems of the Average Small Confectionery Plant with 100 to 200 Employes

by Ralph G. Wells

Member Committee on Industrial and Commercial Planning, Boston Chamber of Commerce.
Member of Faculty, Boston University—College of Business Administration.
Formerly President National Association of Employment Managers.

WHO DOES THINGS IN YOUR PLANT? There have been several requests for a condensed statement of the management methods applicable to the average plant. Below is given a list of the things that must be attended to in any plant regardless of size.

Someone must give attention to these problems in your plant—whether they are actually dealt with by several individuals or attempted by one man struggling alone.

The accompanying article illustrates how one man has lifted himself out of the morass of unorganized methods onto the road of achievement and has simplified the operation and management of his plant.

What Someone Must Do

Determine the line to be manufactured, develop new styles and varieties.
Select packages, wrappers and display methods.
Establish manufacturing standards and production methods.
Determine sales policies, plan sales campaigns and methods.
Make sales and keep business coming into the plant.
Receive customers' orders, see that they are properly executed, shipped and delivered.
Supervise manufacture of candy, packing and preparing for shipment.
Maintain quality; keep down costs, get work out on time.
Handle credits, collections, customers' accounts billing and invoicing.
Arrange finances, banking accommodations, pay bills, watch expenses.
Select and purchase material, control size of inventory, receive, inspect, store and issue stock. Keep records.
Supervise maintenance, repairs, alterations and changes of machines, equipment and plant.
Select and train employees, plan their work, supervise, control, maintain morale.
Develop management and control methods.
Look to the future, plan for the growth and development of the organization.

Subsequent articles in this series will describe actual methods by which these are being handled in successful plants having from one hundred to two hundred employees.

Exclusively for The Manufacturing Confectioner

CONSERVATION of his own time and energy is the most vital problem of the proprietor of the moderate-sized candy plant. Unless he is careful, routine details will swamp him, occupying so much attention that more important matters are neglected and energies that should be devoted to developing and increasing his business will be squandered upon petty activities. His first thoughts should be given to organizing the details of his business so that he can handle them easily, or else turn them over completely to an assistant.

In any confectionery business larger than the "Candy Kitchen" type it is just as serious a handicap to get along without the help needed to relieve the proprietor of details as it is to do without necessary equipment. Sometimes financial conditions may make it impossible to provide either, but the head of any organization should realize that it is false economy for him to spend his time doing things which another

can accomplish. His mind should be free to tackle the really big problems and to plan for the development of his business. Here is the dividing line between growth and stagnation.

The Road to Failure

One type of man fritters away his time on trivial routine that could be handled far better by a good bright clerk; he is always "too busy" to systematize the various phases of his work or to train employees to take over a due share of minor responsibilities. He becomes a slave to drudgery, never able to lift his head above mediocrity. Standing in his own light, an obstacle to his own success, he blunders along until death or failure marks the passing of another "practical man" who was blind to the fact that success and achievement come only to those who master the details of their business, organize them, and train assistants to carry on.

Organizing for Success

The other type of man realizes the value of his own time. Even in the beginning, while his business is small, he trains others to handle details for him and to assume such responsibility as can be delegated to them. He is far from being ashamed to take off his coat and "pitch in," and in emergencies or rush periods he takes hold and carries his full share of the work in hand, but he never allows himself to be chained down so that he cannot get out to see customers, consult his bankers, or give adequate attention to those matters which no one else is capable of handling. As business grows and he can afford to hire more help, he selects those who can be trained to assume the lesser responsibilities and to supervise others, gradually relieving himself of the necessity of watching details closely. Of course he has his disappointments, finding that some have poor judgment, make mistakes, cannot be depended upon, but he never allows himself to succumb to the insidious sophistry that "it is easier to do it myself than it is to take the time or trouble to train someone else." He realizes that once he gives way to the temptation to do things himself, he is endangering his own freedom, his ability, and his success. To the farsighted man, no phase of his business is more important than the development of capable assistants.

Understudies Save Time

Eventually, such a man gathers around him dependable employees—the nucleus of an organization capable of expanding as the business grows and capable of taking in and training other employees. Such an organization is an asset, while the lack of it is a liability. This is an important point. Many proprietors fail through inability to build up an organization capable of carrying on the business when they themselves become incapacitated. One reason why we see so few well organized small plants is that the type of man who can successfully organize a small business soon graduates into the large class.

Our interest, therefore, is not so much in the way that the proprietor himself does his work, but rather in the methods by which he makes it possible for his work to be done by such assistants as he can afford. To be sure, we are also interested in methods used by executives to save their own time and to keep their personal routine running smoothly and rapidly through their own hands. With both these points in view, the writer has been discussing management methods with men operating moderate-sized plants, to learn their actual methods and to note what, if any, were the real differences between the management practices of the so-called "one man" plant and the larger organizations.

This study has led to the development of the following somewhat condensed statement of the management problems of the average candy plant of moderate size. Let it be noted that they are practically the same as the problems of the larger firms. Such differences as exist are chiefly due to size and to the fact that in the smaller organizations one man must of necessity perform many functions which would be divided among several executives in the larger organization. This means that the smaller plant does not need certain systems and control methods necessary in the larger one to insure co-ordination and effective team work.

Planning the Line

One manufacturer considers that his most fundamental problem is planning the line of goods to be made and determining what grades and varieties are profitable for him to manufacture. His theory is that smaller organizations will make more money by specializing on high-grade, staple goods, building up a volume of repeat business on standard varieties for which there is a constant call. Since the average manufacturer cannot compete with large firms unless he has volume on the lines made, he should confine himself to staple lines or a few specialties which will yield large sales with the minimum of sales effort, rather than scatter his energies and his resources over many kinds and grades.

He believes that it costs just so much additional money to introduce and sell each different kind of confectionery and that the plant with a limited capital and limited territory will do better to concentrate its sales energies and production resources on a few good lines. Furthermore, he recommends concentration on a small territory rather than any attempts to sell far from home. Naturally, one should aim at selecting those grades of candy which normally yield a larger profit rather than those on which there is much competition.

This man has found that while he can encourage suggestions from others in his organization, yet the actual planning and selecting of the line of business he manufactures is a responsibility

of such importance that he must carry it on his own shoulders as he is unwilling to adopt the doubtful practice of copying other firms' goods. He prides himself on maintaining a distinctive line. Once the line has been decided upon, he then turns over to his general foreman the responsibility of manufacturing samples and maintaining a fresh supply of them each week for salesmen when they come in.

Next in importance is planning the sales. This man is really his own sales manager and endeavors to visit his larger customers frequently in person. As the plant is located in a large city, he has one salesman with an automobile, covering the local trade and stores in the outlying districts. Outside of what might be called the purely local territory, however, he has found it cheaper and productive of larger volume to secure distribution through jobbers and large retail stores. Therefore, in addition to the local salesman he has one man calling on jobbers and on a selected list of large retailers in nearby cities. In addition, the proprietor himself has secured several rather large accounts in certain cities just outside his regular territory.

While he must necessarily perform the functions of sales manager because he cannot afford to hire someone to do this, nevertheless he has been able to organize the work of his sales department so that practically all of the details are handled by a young woman who is really a secretary-stenographer.

Accounting Work

A third phase of the business to which attention must be given is that of finances, accounting, credits and collections. Here again, this proprietor has been fortunate in having a capable young woman as his head bookkeeper. She passes on all credits, sees that the accounts are properly kept and has proved herself very efficient in collection work. Merely as a precaution, he has arranged to have a public accountant come in at regular intervals, look over the books, and verify certain figures, because such a man can do so in much less time than the proprietor could.

The actual manufacturing is in the hands of a competent foreman, who also oversees the filling and shipping of orders. This man plans his production schedule weekly in consultation with the manager so as to maintain the stock in the stock room at a predetermined level. This level is based on past experience as shown by record of former sales.

Buying of important items of raw material is done by the proprietor of the plant, with the assistance of a stock clerk. The latter sometimes orders in minor items or makes purchases along lines previously laid out by the proprietor. Here again an analytical record of past experience proves helpful.

From the foregoing it will be seen that the proprietor of this plant has organized the routine of his business on the "exception" principle, so that while he personally supervises practically all of the activities of his company, it is only necessary for him to handle the larger matters and those details which are exceptions to the general rule.

He has made careful study of the regular work of each part of his business and has so organized things that others can properly handle them without bothering him. By establishing fairly uniform methods and making everybody familiar with them he is in a position to give more attention to policies, plans for growth, and to those emergency matters which are inherent in any thriving business. To be sure he is a busy man, but fortunately he has the knack of making decisions promptly and is sufficiently courageous to trust in the capacities of assistants that he has personally selected. He believes that confidence in the ability of others to do things is essential to the man who would be a real executive. A few mistakes in carrying on detail are as nothing compared to the greater gain of multiplying one's own capacity many times by developing capable assistants.

Below is a statement of the way in which the duties of each person are laid out. It will be seen that at least this man has succeeded in organizing his work along very sound and economical lines.

What the Proprietor Does

The statement of the duties of the proprietor of this plant and the work actually performed by him would be about as follows:

1. Plans what goods are to be made, lays out sales campaigns, visits principal customers once a year or oftener if convenient, holds weekly conferences with his two salesmen, and in general acts as the sales and advertising manager of his company. But the routine work is handled by an assistant who really acts as his secretary on sales matters and keeps all the details and routine work running smoothly.
2. He serves as the financial and credit man, handling all banking matters and passing on major credits; but here again, the passing of routine credits, the actual handling of accounts, following up collections, making deposits, handling the bank accounts, etc., are left to the head bookkeeper.
3. He supervises manufacturing only in a general way, leaving the actual operation of the plant to his superintendent-foreman, except that when a product is first put out he spends sufficient time in conference with the superintendent to lay out the definite manufacturing standards and to insure that these are maintained until he has authorized some change.
4. Purchases raw material and supplies. In this department of the business, the proprietor only gives his attention to the purchase of the more important items used, and to making contracts when goods can be purchased to better advantage in this way. The raw material stores clerk keeps a very careful record of stock on hand and on the majority of items, having full authority, within certain quantity limits, to purchase

from specified sources any items that may be needed.

The clerk anticipates purchases long enough to secure quotations. This man finds it simplifies his work a great deal to lay out a general purchase program for the entire year and contract ahead for certain goods where favorable prices are given by manufacturers. He realizes, of course, that if he were to give more personal attention to purchasing supplies and lowering their prices, he could save some money, but it is his opinion that his time is too valuable to be wasted bargaining over a few cents.

He is naturally a very shrewd buyer, and through long years of experience, is a good judge of values. Since his stores clerk keeps very accurate records of prices previously paid and of quantities normally used, he is able to purchase advantageously with but slight demands on his personal time.

As previously indicated, one reason why the proprietor of this plant can handle a rather large business without excessive overhead is because he has succeeded in training assistants to handle a great deal of work without close supervision. The way in which he has relieved himself of so many burdensome responsibilities can be best illustrated by a statement of the duties of his assistants.

A Real Foreman's Job

The general foreman is really an experienced all-around candy man and serves both as superintendent of the factory and as general foreman of the manufacturing department. His duties include the following:

(a) Determining with aid of proprietor the most practical and economical method of manufacturing.
(b) Working out formula standards.
(c) Laying out and planning weekly production schedules.
(d) Supervising production and seeing that schedule is maintained and work turned out on time.
(e) Supervising repair and maintenance of machines and equipment, and such other mechanical work as must be done about the building (any extensive repair and maintenance work is done by outside contract).
(f) Supervising the receiving and storing of raw material.
(g) Supervising the finished goods stores as well as the packing and shipping of orders to customers.

The departments supervised by this man consist of the following:

1. Cream Room, where centers, nougats, fudges and caramels are made.
2. Hard candy and miscellaneous manufacturing department, where hard candies, taffies and specialties are made.
3. Starch Room, including moguls, enrobing, and dipping.
4. Packing and wrapping room and finished stock room.
5. Receiving department, raw stores room, and shipping department. This department also handles trucking and cleaning and does minor repairs.

As this plant is able to buy its power and heat outside, it is not necessary to have an engine room or a department devoted to this work. It will also be noticed that there is no definite mechanical department, although one or two of the employees in the receiving room are "handy men" who can turn their hands to odd jobs of the minor sort when necessary. In addition, the superintendent and one or two of his assistants can handle minor repairs.

The proprietor believes it is cheaper in the long run not to try to maintain a mechanical department, as he has little difficulty in getting outside contractors to do the occasional large repairs quickly and at a reasonable price. To be sure, the actual price paid per job to outside contractors is greater than if the plant had its own department, but he claims his figures show that his total cost of repairs and maintenance work done by outside contractors is much less than would be the total cost of maintaining a mechanical department throughout the year.

Operating the Sales Dept.

Perhaps the most interesting development in the plant has been the training of a young woman, who is practically private secretary to the proprietor, to act as sales assistant, capable of handling practically all routine, so that the proprietor only has to give his attention to some of the larger sales problems such as planning campaigns, supervising the work of salesmen, keeping them enthusiastic, and conferring with them at least once a week. He also makes it a rule to adjust all serious complaints personally and to visit from time to time principal customers, so as to keep in touch with them and to know exactly what the trade wants. The routine work of the sales department has been organized so that the duties of the sales assistant are as follows:

(a) Handling all mail relating to sales or orders.
(b) Referring important matters to the proprietor to answer, but she is capable of answering all routine correspondence herself.
(c) Checking orders sent in by salesmen as to prices, terms, etc.
(d) Making out all orders received direct from customers, by mail, telephone, or otherwise.
(e) Keeping the sample room in good order, where goods are on display, and handling customers visiting the factory, if the proprietor is away.
(f) Keeping cumulative record of sales, classified—by salesmen, by customers, and by kinds of candy sold.
(g) Directing sending out of samples, advertising matter, and sales letters.
(h) Following up departments to see that orders are sent out promptly.
(i) Handling minor complaints from customers.
(j) This woman is assisted in her work by one other stenographer, who is kept busy with correspondence and other routine matters.

Keeping the Bookkeeper Busy

As is usual in most factories, there is a head bookkeeper, who occupies the position similar to that which would be called office manager in

(Continued on page 40.)

The Manufacture of Marshmallow

The third article in an extensive series on technical and practical subjects pertaining to the production of confectionery.

by George J. Shaler

IT is impossible to give a formula that will be equally applicable to all types of beaters. When a manufacturer sells you a beater he waxes elegant on its beating qualities, the speed of its operation, the small amount of gelatine required, size of the yield and the range of temperatures it will handle. This being the case it is evident that a less efficient beater will require more gelatine, a more careful cooling of the batch, etc. The fact is that the stronger and more complete the action of the beater the quicker it will finish the batch and the lighter the goods will be. If an extreme swell is not required the amount of gelatine used may be reduced and the standard goods secured.

Requisites of a Good Beater

It is quite a popular error to suppose that the faster the beater is run the lighter the resulting drops will be. This is not correct. If the paddles of the machine are not properly shaped they will not do satisfactory work at any speed. In fact if they are run faster than intended they will actually do harm for in place of beating air into the goods they will simply knock it out again by breaking up the bubbles as fast as they are formed.

A properly made beater is not simply a churn but a machine so built that every revolution of the paddle or rake or, what ever the revolving unit of the particular make may be called, carries a quantity of air down into the body of the batch and distributes it in such a way that it is subdivided and held in by the gelatine. The machine is equipped with large vents to allow of the free entrance of the air required and the escape of heat entering with the batch or generated by beating. These ventilators must be so arranged that they may be open from the first without danger of the mass slopping out.

The bearings of the shaft should be so placed as to bear the strain of the pulley and load without bending and so made that there will be no leak of oil or grease into the batch. This oil would not only discolor and contaminate the batch but the presence of any grease in a batch will prevent its swelling or if introduced after the batch is nearly beaten will "knock it down" again. Many good candy makers have tried in vain to make a marshmallow with chopped nuts in it. For some reason it would not rise. The reason lay in the oil contained in the nuts. It is possible to make such a piece but the nuts must be added at the end of the beating, the machine run slowly and the nuts just stirred through. If you plan making such a piece be sure that your paddle clears the bottom of the beater with sufficient space to assure you against having any of the pieces crushed. This crushing is the surest and quickest way to get the oil out in the batch.

The beater should have at least two speeds, be water and steam jacketed and provided with large enough openings to be readily and easily cleaned.

If the machine is belt driven place it in such a position that no specks of dirt or wearings from the belt will fall in it when it is first started. No matter what type or drive the beater is it should be placed where it can draw in fresh, clean, cool air and no steam.

We will assume that the plant is equipped with up-to-date beaters turning at the established rate of speed for that machine and that the machines are jacketed to maintain an even temperature.

Preventing Graining

The writer has found that in order to eliminate as far as possible the danger of graining it is safest to divide equally the amounts of crystallizable and noncrystallizable sugars. It is true that a drop made from half and half sugar and corn syrup is not sweet enough to satisfy the average consumer and for this reason it is necessary to replace a part of the corn syrup with invert sugar which not only works equally as well as the corn syrup in retarding the formation of crystals but does not reduce the sweetness and at the same time helps prevent the goods from drying out. The proportion of invert sugar to corn syrup is not of great importance but the ratio of 50/50 should be maintained between the sugar and the combination of corn syrup and invert.

Selecting the Gelatine

The gelatine is by far the most important single ingredient. The varying strengths of the different makes and grades on the market make the specifying of definite quantities difficult if not impossible. Furthermore different marshmallow makers demand different grades: some want only the strongest and best while others prefer a lower weaker grade. In general it may be said that for a center or for a piece which is meant to be a little resistant a lower grade may be employed than is required for a

very short white drop. No matter which grade is used it is of utmost importance that it be steril.

The presence of harmful bacteria in gelatine is the cause of many perplexing production troubles and "uninsurable losses." There are various types of bacteria which seemingly have an affinity for gelatine (gelatine is a natural bacteria culture) and much precaution should be taken to obtain gelatine which is practically sterile. Most of the large manufacturers and suppliers of gelatine are in position to furnish even a higher standard of quality than is required by our National Pure Food Laws.

There exists certain types of bacteria commonly found in gelatine which as they grow break down the structure of the gelatine and liquefy it. These are particularly destructive because of the fact that they may not begin their work for some days after the drops are on the market and then when they do start the backbone of the goods is snapped and they become sticky and lose their form. Other forms may work on the gelatine and in their growth produce gases which will puff up the piece or, if it is chocolate coated, burst the coating. At the same time the center will become soggy and of bad odor. Both these conditions are those of decomposition. There is no necessity of either for it is very easy, today, to procure absolutely steril gelatine. Demand this standard and test every batch to satisfy yourself. The following test is not difficult.

A Simple Gelatine Test

Take 95 grams of water which has previously been boiled and place it in a transparent glass. Add to this 5 grams of the sample of gelatine to be tested and heat to 180° F. until the gelatine is all dissolved. Cool and allow to stand. If the gelatine is steril there will be no growth of colonies, that is the body will remain clear and transparent without white specks or spots through it. If this condition continues for three days the gelatine may be considered steril. If after three days little pools of water appear in pits on the surface it is probable that this is due to surface infection after the gelatine solution was poured.

It is not impossible to find specimens of gelatine which may be so bad that before the three days or even forty-eight hours have elapsed the jelly will liquefy around the edges of the glass and over its surface. Needless to say such a specimen is unfit for use.

Dissolving the Gelatine

When dissolving the gelatine it should be soaked for some time in cold water; overnight is not too long, and then dissolved by bringing it to a temperature just below the boiling point. This method, however, is not always convenient and any other method may be used which allows the powder to soak in cold water for a few minutes at least and not subsequently expose it for any great period of time to a temperature in excess of 180° F.

All authorities on gelatine tell us that it must not be subjected to a high heat or it will loose its strength but practice will cause any user to doubt the accuracy of this statement. In fact we candy makers who use gelatine have been led to a fairly well confirmed conclusion that it is rather the prolonged heating than the actual degree to which it is heated that causes loss of strength. Many marshmallow makers find it expedient to soak the gelatine for ten or fifteen minutes and then add it to a boiling batch, turning off the steam when the paste is added. The temperature of the batch melts the gelatine and at the same time the cooling of the batch is hastened. This method works out so well that in spite of many trials the writer has failed to find that it is inferior in any way to adding the gelatine to a cold batch after having dissolved the gelatine at 180° F. In the formulas which will follow the gelatine is called for in many different forms.

Gelatine should always be melted and soaked in a container which will not discolor it. Glass or earthenware are best but difficult to handle in a manufacturing plant. It is all right to use enameled ware if care is exercised to avoid chipping but for all around satisfaction a high grade aluminum utensil is best. A wooden pail, if kept clean and frequently scalded, will answer the purpose.

Discoloration

In some marshmallow it is necessary to use albumen and this requires the closest watching for it is the source of more discoloration than any other one material employed. This discoloration is due to two different and distinct causes. One is inherent in the egg and the other is attributable to outside contamination. The yolk of an egg is yellow and this yellow color is surprisingly strong in its action. In the separation of the yolk from the white it often happens that the yolk is broken and a small quantity of it gets mixed with the white. If this is the case it will remain in the albumen when dried and cause a very decided cast to the marshmallow.

Albumen has a decided affinity for iron and if the egg whites come in contact with iron either in receptacles or on the drying rack, it will absorb a small quantity which in this way will become mixed with the marshmallow and, as time goes on, will oxidize and turn the drops yellow or even brown.

Both these troubles can be detected by a chemist and the lot rejected. At the same time he should be on the lookout for foreign matter such as sticks of wood, sand, etc., which are bad in the finished goods and add to the weight of the original package without due return on the cost. Another point to observe is the quantity of insoluable matter which appears in the form of white flakes and strings when the albumen is soaked. This is egg white that was overheated

during the drying. The effect of this overheating is the same as that of boiling an egg. It is valueless for beating.

Many of these troubles may be avoided by the use of fresh or frozen egg whites. A number of firms are engaged in the putting up of eggs in this form and if the manufacturer is near enough to a large center he can secure his albumen in this form. The frozen product when thawed out will beat up better than the dried product and has none of the latter's unpleasant odor and taste. Four pounds of the frozen product is equivalent to one of the dried and at present the price is guaranteed to be better per dry pound than that of dried albumen. The results obtained by its use are vastly superior in the opinion of the writer.

If a manufacturer's product is not perfectly white there is only one course for him to pursue and that is to check every item which enters into his goods and see which one is the cause. It may never be possible to pin the blame on any of them but remember the work is toward an absolute white and the least trace of color will be noticeable. Fine granulated sugar will carry some color; glucose will carry some, the gelatine more and the albumen, if that is used, still more. Check up on each material and get the most nearly colorless kind you can of each. It is the firm and well borne out conviction of the writer that more color trouble comes from accumulation through every source, a little here and a little there, than is ever traced to any one ingredient.

There is of course another cause of discoloration entirely apart from the drop itself and which was discussed in the last issue. If the moulding starch is too hot when the goods are cast they will get very yellow or even a straw color on the surface.

Adjust Formula to Beater

The formulas given in this chapter are applicable to different types of beaters but must be set up to meet the possibilities of the beater to be used. As already stated one beater will require more gelatine than another to produce goods of the same count; another will handle more water or more water at one time, while a third, if humored and coaxed along, will make the same batch as either of the first two but the batch must be fed into it differently and more time given to accomplish the desired results.

In figuring the proper portions for your beater it is best to start your trial batch with a minimum of water and gelatine then add more as required, keeping careful account of these additions. The next batch may be set up right from the start and will probably come out satisfactorily unless the beater is inefficient when it will be necessary to add the water in two or even more portions.

Many marshmallow makers object to the addition of any water and insist that when a batch must be "cut back" only syrup should be used. This may be right although the writer has never found it so. If syrup *is* used it should be of the same composition as the batch that the balance of crystallizable and non-crystallizable sugars may not be disturbed.

Simple White Marshmallow (Short)

(1) 20 lbs. Corn Syrup (430)
8 lbs. Invert Sugar

(2) 28 lbs. Sugar
1½ gals. Water

(3) 1 lb. Highest Grade Gelatine soaked one hour in ½ gal. cold water

(4) 1½ lbs. fresh egg whites

Place No. 1 in the beater and beat white. Add 10 per cent of soft scrap from preceding batches.

Heat No. 2 until *all* sugar is dissolved.

Add No. 3 to No. 2 and stir until melted.

Place the above mixture (3 and 2) in the beater and beat for 10 minutes. Add (4).

Beat until one gallon weighs 3 lb. 11 oz. net then flavor and cast

White Marshmallow (Cheaper)

54 lb. Sugar
43 lb. Corn Syrup
2½ to 3 lbs. Gelatine.

Dissolve the gelatine in 8 qts. of water and heat to 180° F.

Put all ingredients in the beater and beat at slow speed until all sugar is dissolved then speed up and beat 3 lb. 8 oz. to the gal.

White M. M. for Rolling in Toasted Cocoanut

(1) 43 lbs. Corn Syrup
6½ lbs. C. T. B. Starch

(2) 40 lbs. Corn Syrup
40 lbs. Sugar

Put No. 1 with 4 gals. of water in a steam kettle and cook to a light string.

Put No. 2 in the beater with 2½ to 3 lbs. of good gelatine and beat white then add No. 1 fairly hot and continue to beat until one gallon weighs 4 lb. 4 oz.

White Marshmallow for Packages

30 lbs. Corn Syrup
60 lbs. Sugar
3½ lbs. Thin Boiling Starch

Cook the foregoing to 228° F. then add 3½ lbs. of good gelatine which has been soaked in 2 qts. of cold water. Allow to cool to the temperature of the hand then beat until one gallon weighs 4 lbs. 3 ozs.

Marshmallow Centers

(Short for pack goods)

35 Corn Syrup
35 Sugar
2½ Alkaline heavy boiling Starch

Cook with water enough to dissolve sugar to 228° F. and pour over 1 lb. of gelatine which has been soaked in two quarts of cold water.

When batch is cool beat for ten minutes then add 1 lb. albumen dissolved in 1 qt. of water and beat to desired lightness.

Stringy Marshmallow

70 Sugar
60 Corn Syrup
4 Gelatine
101 Milomoline

Place all in the beater and proceed as in No. 2 using about 11 qts. of water on the gelatine.

These centers should not be dipped too fresh. Allow to stand in the starch for approximately 24 hours.

400 Type of Marshmallow

45 lbs. Sugar
60 lbs. Corn Syrup
9 lbs. Thin Boiling Starch

Cook with sufficient water to dissolve sugar to 224° F. then cool to 150° F. and beat with 1 lb. of albumen soaked in 1 qt. of water until one gallon weighs 5 lbs.

Hard Marshmallow, Bananas, Etc.

This class of goods is about as near to a fondant as to a marshmallow. In fact the beating should start the grain and in a way cream the batch. The two formulas which are given show the two different methods commonly used in making toys of this kind. The writer prefers the first although it has its disadvantages for the goods prepared from it are too hard for winter shipment.

(1) 25 lbs. Powdered Sugar
2½ lbs. Gelatine soaked in 11 lbs. cold water

(2) 25 lbs. Sugar
10 lbs. Corn Syrup
Cook No. 2 to 240° F.

Beat No. 1 stiff then add 10 lbs. corn syrup and beat for 5 minutes.

Add No. 2 and beat for 3 minutes then color and flavor.

Continue beating until one gallon weighs 3 lbs. 2 ozs.

Cast in dry warm starch and set in room at 110° F. for twelve hours. Cool and shake off.

Second Formula Hard M. M.

80 lbs. Sugar
40 lbs. Corn Syrup
3 lbs. Gelatine

Beat fairly stiff then add 20 lbs. 80/20 cream cooked to 242° F. and continue to beat until one gallon weighs 3 lbs. 5 ozs. then cast and let set at 100° F. for twenty-four hours.

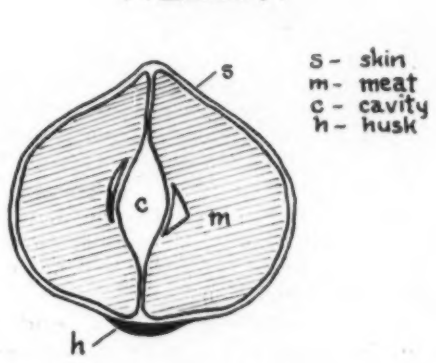
Desk Tests for Shelled Nuts

(Continued from page 25.)

halve a filbert without exposing any mould which may be present. For accurate results, again halve the kernel in a plane perpendicular to the first cut.

Grade out the mouldy kernels. The number of kernels so ascertained represents the percentage of internally moulded filberts present in the sample.

Many persons confuse with mould the dark brown crust which forms inside the kernel as the meat dries out, a phenomenon equally as peculiar and interesting as the tendency of the filbert to mould from the inside. A brief explanation of the physical process which causes these changes, might not be amiss at this time.



In addition to being naturally porous, the expansion and contraction of the outer skin under changes in temperature, causes the skin to crack and let in air. As the meat itself contracts, the vacuum formed at "c" causes air to be sucked in from the outside. When the nut expands, this air is expelled. Thus the nut may be said to breathe with the changes in temperature. Now, if the air which the nut breathes in is dry, it causes the evaporation of the oil and moisture from the surfaces of the cavity with the result that these surfaces form the dark brown crust which is common to old or dried out meats. On the other hand, if the air which the nut breathes in is damp, and contains a lot of mould spores, the interior of the nut commences to mould quickly.

(*To be continued*)

In the concluding section on nutmeats:
Determination of Age or Crop Year;
Rules for Examining for Animal Life in Nutmeats
Distinguishing Ear-marks on Walnuts, etc.

When and Where Shall the Foreman Study?

The fifth of a series of twelve articles on Foremanship

by J. K. Novins

BEFORE the factory management can definitely outline a course of study for foremen it must settle to its satisfaction, and to the satisfaction of the men, a number of preliminary points. The first thing that occurs is the question, "On whose time should the instruction be given?" Should it be given on the company's time? Should it be given solely on the time of the foremen? Or should the management and the men share equally in the expenditure of time on such instruction?

Having satisfied itself on this point there comes up the question of the length of time that should be devoted to the instruction. The course should have a definite purpose and aim and the length of time to realize the aim must be taken into consideration in advance. Also, the length of the course will help settle the point as to who shall pay for it. Should the course last three months, six months, or a year?

The next question is, "Should the group conference be held once a week, twice a week, or oftener, or should it be held once every two weeks or once a month?"

The last, by no means the least important, question is "Where shall the group conference be held?" Should it be held somewhere in the plant, or in some public place outside of the plant? Should there be a regular meeting place, or should conferences be held wherever convenient at the time?

Where the course of study is intensive and lasts a comparatively short time the tendency is to hold the group meeting on the company's time during the workday. This is especially true when the foremen attending the conference are picked men, and the company expects to derive immediate benefits from the training. However, managements are now getting away from this tendency, and the most popular arrangement at the present time is to hold conferences after working hours.

Study on Company's Time

Training foremen on company time is apt to prove more than an expenditure of money to the company. It involves taking the foremen from their tasks, and most times it is very difficult to replace them temporarily so as not to interfere with production in the respective department. However, there is a definite advantage in that the men appreciate all the more the training they receive and they therefore apply thmselves more diligently to the studies. They realize that they must make definite returns to the company in the way of greater executive efficiency.

Where group conferences are held during the workday it is understood that the company furnishes the time. Where the conference is held after the workday it is understood that it is on the men's time. In solitary instances, the firm pays the worker overtime for time expended on group study.

Another element we must take into consideration is that conferences held during the workday are sometimes compulsory, while evening study is more likely to be voluntary on the part of the foreman. And then we must consider that the firm more often pays a half or the entire cost of a course supplied by an outside institution, and in addition the firm furnishes the meeting place, and sometimes a paid leader.

Another arrangement most firms enter in with the foremen students is to have the group conference meet in a hotel or restaurant, and if the plant is a very large one, in the plant cafeteria. Before the lecture and discussions, held on foremen's time, the firm gives the men a supper. This has proven a satisfactory arrangement and serves to maintain a good spirit throughout the evening. In this way the study period proves less irksome.

Still another arrangement is for the firm to share the time-expense with the men. In that case the two-hour session begins at four o'clock and ends at six. Since the workday ends at five, the foremen will have consumed only one hour of the company's time, they furnishing the second hour. This has proven a satisfactory arrangement in some plants. However, it is not a common arrangement.

Length of the Course

The length of the course depends chiefly on the special educational needs of the foremen in a particular branch of factory operation and

organization. It also depends a good deal on the educational background of the foreman student. Broadly speaking, the length of a course may be from one month to three years, and even longer.

The length of the course often governs the number of meetings per week or per month. In an intensive course of, say five weeks, it is advisable to hold session several days a week, or even daily. This is on the theory that the foreman-student should be in a position to apply his newly-gained knowledge to his everyday job just as soon as possible after he has learned his lesson. This arrangement is especially necessary where the firm is anxious to eradicate a chronic labor turnover and a sudden slackening of production due to mismanagement. Quick action is in order and the foremen must learn rapidly. The writer knows of one plant where an intensive course of foreman-training required daily attendance by the entire supervisory force, from 10 to 11:30 in the morning.

The Flexible Course

Where a long course is planned, one that covers the entire field of executive training for the foreman, it should be sufficiently flexible to be offered in parts, each part constituting a definite course of study with definite application to special needs of a group of foremen. The Federal Board for Vocational Education suggests a complete course covering 82 sessions, or a total of 164 hours. However, the course is divided into three sections, dealing with supervision, cost elements and management respectively. These divisions in turn are subdivided to a total of eleven units Each unit, or group of units, can be offered as a separate course designed to meet the pressing educational needs of a group of foremen. Furthermore, the entire course can be offered in units simultaneously to several groups of foremen.

Many firms find it advantageous to introduce foreman training with a brief course. The course is of a more or less technical nature and appeals strongly to the men who are not accustomed to class group or individual study. Having convinced themselves that such training is benefiting them, the men are prepared for the more lengthy course which takes up the broader and more general phases of executive management. Thus, a certain firm has developed brief courses of three or four months' duration. The employment manager who organized the course watches the progress of the work as it appeals to each man, and he hopes to use this information to develop a subsequent longer course. He hopes that in time he may develop a course of study to last five years.

In the small plant the safest thing to do is to develop a short course of, say, three months, shaping the subject matter so as to appeal to every man in the group. Later other courses will be added, and the group then subdivided into smaller groups and courses offered to meet the individual needs and interests of the men. In the larger plants the opposite plan is often used; specialized courses are offered to groups, and a general course is then offered to all men.

How Plants Co-operate in Training

Where the plant employs only a few foremen it is a good idea to combine with several other local firms and arrange a group of foremen employed in these plants. Care must be taken, however, to interest only those foremen who have common educational interests.

A plan followed by several hundred large and small firms provides for an intensive course of training lasting twelve weeks, the groups meeting formally every two weeks to discuss the lessons. The groups generally meet right after work. The study period is preceded by a supper served at the expense of the firm, and the study session generally ends around 7 or 7:30 p. m. The foremen can go home with the feeling that they have not been deprived of a full evening.

The length of the course also depends on the technical experience of the foremen. In one plant a course lasting six months is offered. Another course lasting a year is offered to foremen who have had considerable technical experience. In another plant the length of the course is optional with the foremen. The official time of the course is two years, but it is divided into terms of four months each. A foreman can study as many terms as he chooses, but he must undertake to finish at least one term before he can take another term of study. While some courses provide for two sessions a week, the general rule is for a session of two hours weekly, and where the course is protracted the session may be held fortnightly or once a month. Hardly ever does the intervals extend over a month.

Best Time to Study

There is no question that the best time for a group to meet is the first thing in the morning, as the men are fresh and thinking capacity is then at its height. But everyone at all familiar with a foreman's duties will tell you that this arrangement is hardly practical, as the foreman's time is pretty well taken up in the planning of the day's work. Taking the foreman away from this task might cut into the department's production for the day.

Holding the conference after the workday also has its disadvantages, chief of which is that the men are tired and hardly inclined to do solid thinking. As already pointed out, this is gotten around by treating them to a pleasant supper party right after the day's work, and then after a brief chatting period and a smoke they are refreshed for study.

In one plant, where an intensive course of foreman training was in progress, the management arranged for one session a week in the morning and a second session on an afternoon, right before closing time, the session lasting until about an hour after the factory closed.

Valuable Free Literature

The following publications—booklets, house-organs, catalogues, etc., are free for the asking, and will be sent to any of our readers upon request of the publisher, or if you check the ones you are interested in they will be forwarded from our Buyers' Directory files.
The Manufacturing Confectioner Publishing Co., 30 North La Salle St., Chicago.

Vanillas.—A treatise on the construction of concentrated vanilla flavors both pure and fortified. Foot & Jenks, Jackson, Mich.

Nature's Finest Flavors.—A discussion of the manufacture of terpeneless citrus natural fruit flavors, in concentrated form, from the harvesting of the fruit to the finished product.—Foot & Jenks, Jackson, Mich.

Merrell--Soule Powdered Milk for the Confectioner and Milk Chocolate Manufacturer.—A booklet describing the manufacture of powdered milk, tests for the buyer of powdered milk, and practical recipes for the candy maker.—Merrell-Soule Sales Corp., Syracuse, N. Y.

Valuable Information About Gelatine.—A 24-page booklet which gives much space to a discussion of gelatine in an impartial way. There are chapters on the legal regulations, pointers on purchasing, testing food value, function and uses of gelatine.—Harold A. Sinclair, 160 Broadway, New York City.

The Story of Delft.—An artistic booklet illustrating the city and folk of Delft, Holland, also how and where Delft gelatine is made.—Harold A. Sinclair, 160 Broadway, New York City.

Facts About Food Gelatine.—A 16-page booklet on gelatine and its uses written by a disinterested scientist and originally published in The New York Tribune. An interesting informative treatise on the definition, manufacture and the diversified uses of gelatine.—Milligan & Higgins Gelatine Co., 222 Front St., New York City.

The Helper.—A 20-page booklet, illustrating in actual colors, the principal lines of confectionery in which Nulomoline may be used advantageously. A short analysis of the characteristics of each kind of candy is given together with a suggestion for the solution of the principal problem in the manufacture of each class of goods illustrated.—The Nulomoline Co., 111 Wall St., New York City.

Formulas for Wholesale Trade.—A set of 36 formulas, each on a separate sheet, specially adapted to requirements of the wholesale manufacturing confectioner.—The Nulomoline Co., 111 Wall St., New York City.

Formulas for Retail Trade.—A set of 65 formulas designed for the retail candy shop.—The Nulomoline Company, 111 Wall St., New York City.

The Candy Makers' Guide.—A booklet describing Senneff-Herr's full line of candy makers' specialties and a set of formulas for using them. Senneff-Herr Co., Sterling, Ill.

Sugars for Manufacturers.—A pamphlet on the various sugars made for manufacturers with suggestions for using them, by C. W. Nordland.—Franklin Sugar Refining Co., Delaware and Wharton Sts., Philadelphia, Pa.

Refrigeration in the Candy Factory.—A booklet containing a series of five articles on refrigeration and air conditioning and their direct application to the manufacture of confectionery. These articles were written by A. W. Lissauer specially for The Candy Manufacturer and published in our issues of June to October, 1922, inclusive.—W. L. Fleisher & Co., 31 Union Square, West, New York City.

Candy News.—An 8-page leaflet with articles of interest to the trade, issued monthly by National Equipment Co., Springfield, Mass.

Ungerer's Bulletin.—A 16-page semi-technical publication containing articles of interest to users of essential oils and flavors. Issued by Ungerer & Co., 124 West 19th St., New York City.

"SX".—A breezy little 16-page pocket edition, edited by Peabody and published monthly by Essex Gelatine Co., 40 North Market St., Boston, Mass.

General Catalogue and descriptive literature on candy and chocolate machinery.—National Equipment Co., Springfield, Mass.

General Catalogue.—Confectioners' machinery and tools.—Thomas Mills & Bro., 1301-8 North Eighth St., Philadelphia, Pa.

General Catalogue.—Candy machinery, tools and utensils.—Savage Bros Co., 2638 Gladys Ave Chicago.

Working Formulas.—A 22-page booklet giving formulas and directions for using White-Stokes Products in the candy factory. White-Stokes Co., 3615 Jasper Pl., Chicago.

General Catalogue.—Air conditioning apparatus. Also list of 77 other special Sturtevant catalogues covering in detail each item in entire line.—B. F. Sturtevant Co., Hyde Park, Boston, or W. L. Fleisher Co., 31 Union Square, West, New York City.

General Catalogue.—Ideal chocolate and cocoa products, illustrated in actual colors.—Ideal Cocoa & Chocolate Co., 39 Park Place, New York City.

The History of Vanillin.—A 16-page booklet gives briefly the story of Vanillum and its virtues. It gives a survey of the history, uses and advantages.—Monsanto Chemical Works, St. Louis, Mo.

Sweetmeats.—A Franklin Sugar Book of Recipes for making Candies and Bon Bons, Conserves, Cake Icings and Meringues, by Caroline B. King.—The Franklin Sugar Refining Company, Delaware and Wharton Sts., Philadelphia, Pa.

National Certified Food Colors.—This booklet illustrates in color the use of National Certified Food Colors. In addition it lists the complete line of primary shades and blends and gives suggestions for their application.—National Aniline & Chemical Co., 40 Rector St., New York City.

(897) *We have had trouble with Oriental Paste and would appreciate your criticism of the methods used by us.*

The formulas used were as follows:

No. 1—

10 *pounds sugar*
2 *quarts water*
1¼ *pounds boiling starch*
5 *quarts cold water added to batch after it had started to boil*
Flavoring extract added after batch finished cooking.

No. 2—

10 *pounds sugar*
2½ *pounds corn syrup*
1 *quart water*
1¼ *pounds boiling starch in 5 quarts water*
Flavoring extract.

We cooked these batches for an hour with very little steam turned on, then used the finger test and it seemed to be all right. After finishing, the batches were poured into a paper-lined tray. Both batches sweat and were too short to handle and not clear. We would like it to be tender and still be a good looking piece. Any information you can give us will be appreciated.

Oriental Paste

TURKISH paste, as the average candy maker knows the favorite confection of the East, is there known as Rahat Lakuum and was originally made from honey and rice starch or honey and figs flavored with musk, quince seed, rose, or a combination of oriental favorites. It is really delicious made in this way, but should be eaten at once, as no thought is given to producing a confection that will show any particular keeping quality. The sweets seller or caterer makes a batch, advertises the fact and sells it. He does not ship it half around the world and expect it to stand any kind of handling for four or five months.

The Turkish paste of this market is nothing more than an undried gumdrop cut in squares. The balance of the ingredients lies in a proper proportion of crystallizable to invert sugar and enough starch to hold the great amount of water in suspension when the piece is exposed to ordinary room conditions.

As the starch is called on to perform such hard and special duty it is necessary to choose it with the utmost care. For cut jellies, fruit gloss laundry starch is preferred, as its body is far greater than thin or Turkish paste, a heavy boiling starch known to the trade as boiling or pearl starch, and it is capable of holding a larger quantity of water in suspension. If it is required, an alkaline starch of the heavy boiling variety may be obtained and this is preeminently suited for the manufacture of this grade of candy.

Different cooks have different methods of cooking paste and the writer has seen a good dry product, one that did not sweat, turned out by exactly contrary methods. If a good deal of water is used a clear, slightly stringy piece should result, while if the water is cut to a minimum the resulting product will be very short and somewhat cloudy. Oddly enough, as stated above, either method is capable of producing a lasting confection.

Formulas for both methods are given further on, but no matter which is used, the following generalities will hold good:

The kettles used should be steam jacketed and equipped with fairly fast stirs. The purpose of speeding up the stirs is to make possible the cooking of the batch to a point so high that it would burn in an ordinary gum kettle. Very little water will dry out once the cooking is stopped, for a solid cake of gum poured in a tray exposes too small a surface to the air of the room. Whatever water is to come out, therefore, must leave the batch in the kettle. This point is often overlooked and the result is sweaty paste. Cook until the batch falls from a spatula in heavy lumps and the web from which it dropped springs back and remains hanging from the knife in a broad sheet with a considerable accumulation of jelly on the end.

Pour out in wooden trays which have been rubbed inside with flour and allow to stand for about two days with a circulation of air about them.

Cut and roll in *standard* or *coarse powdered sugar*. Pack with sugar between and seal fairly tight from the air. Wood boxes make the best containers for this type of goods.

The following formula is good and should work out all right if handled according to instructions:

100 pounds granulated sugar
110 pounds water.

Place in kettle and bring to a boil, then add 7 ounces cream tartar and 10 pounds of heavy boiling starch suspended in 25 pounds of water. Cook to a point as described above, color flavor and pour in trays. This batch should be cooked with about 60 pounds of steam and take about one hour, not less, to cook.

As opposed to this, the following formula and instructions worked well:

100 pounds sugar (preferably the scrapings from crystal pans, otherwise use granulated)
11 pounds heavy boiling alkaline starch
5 gallons water.

Bring sugar and water to boil, then add 10 ounces of cream tartar and the starch suspended in 12 gallons of water. Cook with 80 pounds steam pressure in a wide, shallow kettle, with quick stir. Should take about half an hour.

These two formulas are totally different, but both give good results.

The following is a good combination for cheaper goods:

150 pounds corn syrup
25 pounds heavy boiling starch
36 pounds sugar.

Bring the sugar and corn syrup to a boil with 60 pounds of water, then add the starch with 40 pounds of water; cook with 80 pounds of steam, to take about one hour. Color, flavor and pour.

Any good sugar can be used in fig paste, but the weaker the better. Some of the best paste is made from residue crystal syrup or the scrapings from crystal pans. When syrup is used the quantity should be figured as 80 per cent sugar and 20 per cent water.

Organizing to Save Time

(Continued from page31)

the larger organizations. This head bookkeeper has two assistants, who do the actual bookkeeping, make out the bills and statements, and still find time to assist with other work.

The duties of the head bookkeeper include the following:

(a) Keeping the firm's private ledgers herself.
(b) Supervising customers' accounts; bills payable ledger and making out of bills and statements; making deposits; keeping track of the bank account; keeping the proprietor informed as to when notes are due.
(c) Handling routine credits and collections. Unusual matters are referred to proprietor for personal attention.
(d) Through an assistant, keeping the stores balance ledger, both for raw material and finished products.
(e) Through this same assistant, handling all cost work.

The foregoing describes all of the management of the organization required to operate this plant, with the exception, perhaps, that mention should be made of the stores clerk who assists the proprietor in purchasing material and supplies. While he does not actually keep the balance of stores record himself, he is in such close touch with it that he knows exactly the quantities of goods on hand. He is both receiving and stores clerk, handling the actual receiving of material, putting it away, and issuing it as called for by requisitions.

The hiring of employes is handled by the head of each department, as the plant is too small to warrant a central employment office. The foreman picks out all help for the various departments under his control, although the proprietor has made it a rule, except during rush periods, to see all new employes taken on, not so much because he does not trust the judgment of the factory head, but because he believes it is essential in a small plant for the proprietor to know employes personally and to make them feel he has an interest in them and attaches enough importance to their position to want to see them. The proprietor himself employs the office help, but he leaves the interviewing of applicants and preliminary selections to one of his assistants. Thus it is not necessary for him to spend his time interviewing anyone until he is pretty sure they will be selected.

An Eye to the Future

This owner is contemplating a further step just as soon as he can convince himself that his business has grown large enough to justify it. This is the hiring of a young chemist to assist in solving some of the technical manufacturing problems. The duties to be performed by this chemist as the proprietor has outlined them in his mind are as follows:

(a) Experimental and research work in connection with new lines.
(b) Determination of best formulas for manufacturing.
(c) Establishing manufacturing standards, both as to methods and quality.
(d) Establishing material standards, purchasing specifications and methods of storing and handling materials.
(e) Testing samples of materials submitted by salesmen.
(f) Testing and inspecting incoming raw materials.
(g) Inspecting of products in process and making control tests where desired.
(h) "Trouble shooting," investigating manufacturing difficulties and finding out why batches go wrong.
(i) Examining competitive products.

He believes that the establishment of such a department will eliminate waste and insure definite savings in many ways, including better manufacturing standards, the inspecting of incoming raw material and insuring that it is up to the required quality.

Perhaps the greatest saving contemplated, however, is somewhat intangible. This is the relief to the proprietor and also to the foreman in having at hand someone to whom they can refer technical problems for solution.

This firm has allotted accurately every responsibility.

The allottment of responsibility means simplified routine, but not that superabundance of system that is known as "red tape."

Lack of organization means confusion and therefore leads directly to failure.

Notice

We have arranged to have Mr. Wells in attendance during convention week of May 19th; Mr. Wells will be glad to meet our readers at The Manufacturing Confectioner's Booth No. 46 and 47.—EDITOR.